(*P. succulenta*). A study of the leaf anatomy showed the presence of either numerous internal oil glands or a single secretory duct adjacent to the phloem of the vascular tissue of the midrib. Certain species have external secretory and non-secretory trichomes that are present on both surfaces of the leaves. The distribution of trichomes agrees quite well with the existing sectional classification system. The essential oil of selected species were distilled and analysed by gas chromatography–mass spectrometry (GC–MS). Myrcene and sabinene are often the main compounds. Anti-microbial studies give scientific support for most of the recorded medicinal uses. Methanol and dichloromethane extracts and essential oils were more active than aqueous extracts. A review of the ethnobotany and leaf anatomy of the nine species will be presented, together with a summary of the essential oil chemistry and antimicrobial activity of *P. onobromoides*, *P. camphorata*, *P. divaricata* and *P. incana*.

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Pursuing imazapyr herbicide tolerance in sugarcane: Screening plants produced *in vitro* through somaclonal variation and mutagenesis

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Herbicide tolerance is a highly desirable trait in commercial sugarcane. This study explored a strategy for the production of imazapyr-tolerant sugarcane. A protocol for the production of imazapyr-tolerant sugarcane lines through *in vitro* somaclonal variation and induced mutagenesis of somatic embryogenic cultures of the N12 sugarcane cultivar was developed. The chemical mutagen ethyl methanesulfonate (EMS) was used to induce a single target-site mutation in the acetolactate synthase gene, and tolerance of regenerated plantlets was tested using the herbicide Arsenal (250 g/l active ingredient imazapyr). The initial work determined the mutagenic (8 mM and 16 mM EMS for 4 h) and *in vitro* screening conditions (LD_{50}=0.042 μM, LD_{90}= 0.08 μM imazapyr in the medium) for 6–10 week-old somatic embryogenic calli, and the screening treatment for acclimatised *ex-vitro* control plantlets (spraying with Arsenal). As the culture conditions (included 2,4-dichloro-phenoyacetic acid) alone did not cause a significant production of somaclones, the mutagenic agent was deemed essential to increase the chance of producing herbicide tolerant plantlets. The EMS and imazapyr treatments were then applied in combination and calli were exposed to increasing levels (0.042–0.16 μM) of imazapyr. Plantlet yield decreased and regeneration time increased with increasing stringency of EMS and imazapyr regimes compared with the untreated control. For all treatments, callus mass, number of green and abnormal (albino and visual chimaeric) plantlets, and biomass of acclimatized plantlets were recorded. Amplified fragment length polymorphism analyses were performed on plants surviving exposure to EMS or imazapyr. Profiles were compared with plants derived from the standard tissue culture protocol and field grown N12 plants to determine how each treatment affected the number of polymorphic bands. At present, putative-tolerant plants, which have been exposed to either EMS or a combination of EMS and imazapyr, are being acclimatised after which they will be sprayed with Arsenal (102 g a.i./ha; 0.39 M) to confirm their tolerance.

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Assessing the floristic importance of proposed conservation areas in North-West Province in the context of the western Central Bushveld Bioregion

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South Africa is one of the world's megadiverse countries harbouring over 21 000 plant species with 60% endemism. Much of this rich biodiversity is increasingly under threat due to the development needs of a developing country. As a result South Africa has made a commitment for conservation and the sustainable use of biodiversity by ratifying the Convention on Biological Diversity in 1995. Biodiversity planning has become a key focus area that aims at identifying diversity hotspots and priority areas for conservation within and outside of formally protected areas. These are identified by the quantification of indicator taxa (e.g. rarity and endemism) and their distribution patterns. The conservation status in North-West Province is low, with only about 3% of its area set aside for conservation. Proposals have been drafted for park expansion to increase this percentage based on the availability of land and linking existing conservation areas. Thus, the aim of this study was to assess the floristic importance of two proposed high priority conservation areas in the context of the western Central Bushveld Bioregion. Plant species data collected from the two study sites was integrated with existing collection data from the PRECIS database (National Herbarium Pretoria (PRE) Computerized Information System) for the 50 quarter degree grids of the western Central Bushveld Bioregion. The data was subjected to ordination with Primer at different taxonomic levels to demarcate broad floristic patterns, which were correlated with environmental data using ArcView. Important plant taxa were identified and quantified in order to demarcate Important Plant Areas for the western Central Bushveld Bioregion and to determine whether these overlap with the proposed priority conservation areas.

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